Section 7.4
Lower Gila Basin

7.4.1 Geography of the Lower Gila Basin

The Lower Gila Basin, located in the center of the planning area is 7,309 square miles in area, the largest basin in the planning area. Geographic features and principal communities are shown on Figure 7.4-1. The basin is characterized by plains and valleys surrounded by low elevation mountain ranges. Vegetation types include Lower Colorado River Valley and Arizona Uplands Sonoran desertscrub. (See Figure 7.0-7)

- Principal geographic features shown on Figure 7.4-1 are:
    - Principal basin communities of Ajo, Dateland, Tacna and Wellton
    - Other basin communities of Dome, Fishers Landing, Hyder, Sentinel and Why
    - The Colorado River on the western basin boundary in the vicinity of Fishers Landing
    - The Gila River running east to west through the center of the basin
    - Numerous valleys and plains including Mohawk, San Cristobal, Growler and Childs Valleys in the southern portion of the basin and Castle Dome and Palomas Plains and King and Hyder Valleys in the northern portion of the basin
    - Mountain ranges including the Cabeza Prieta, Mohawk, Granite and Growler Mountains in the southern portion of the basin and the Castle Dome, Tank, Kofa and Gila Bend Mountains in the northern portion of the basin
    - The lowest point in the basin at 160 feet west of Dome where the Gila River exits the basin
    - The highest point in the basin, Castle Dome Peak, at 3,788 feet in the Castle Dome Mountains west of Fishers Landing

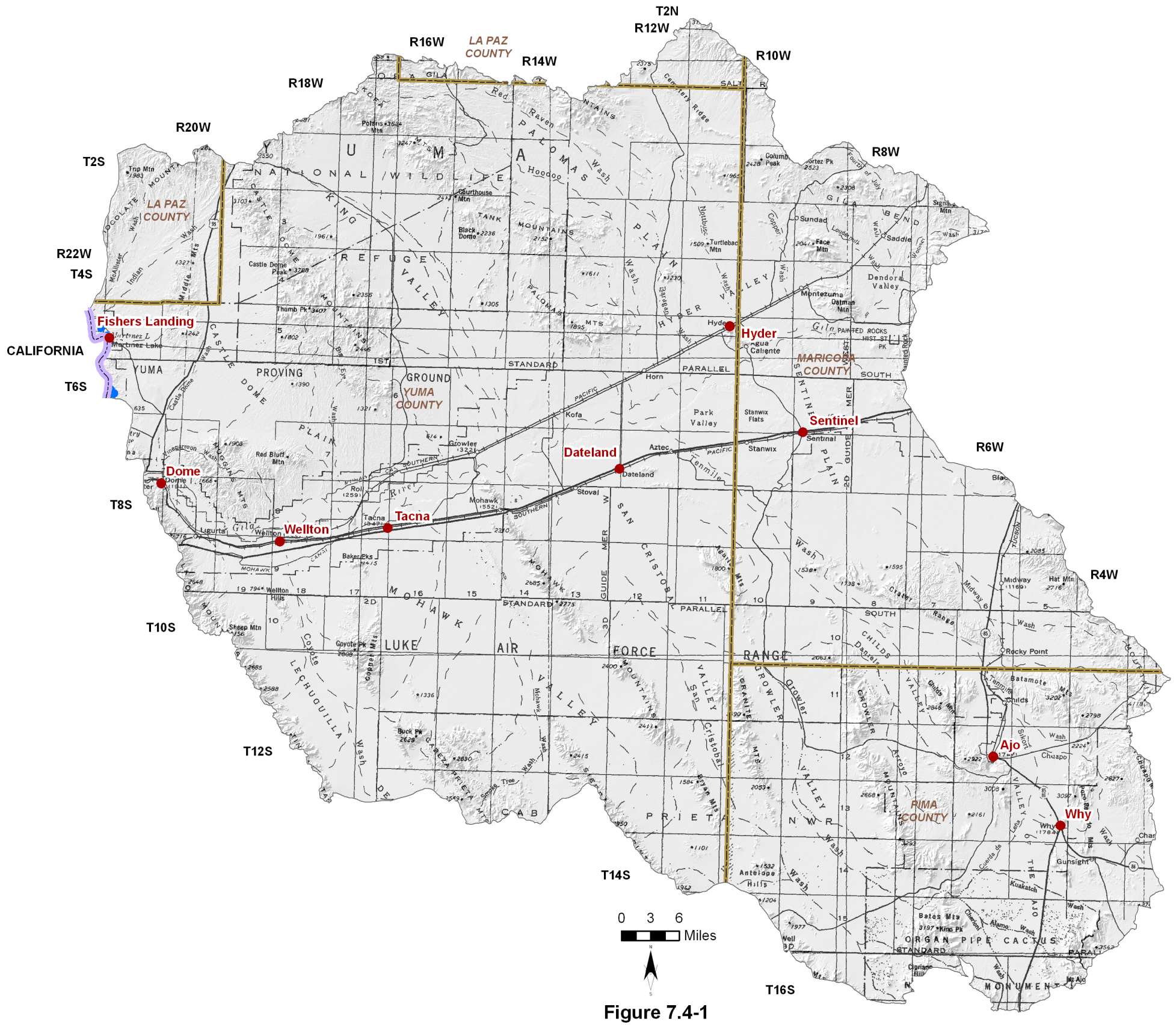


Figure 7.4-1
Lower Gila Basin
Geographic Features

7.4.2 Land Ownership in the Lower Gila Basin

Land ownership, including the percentage of ownership by category, for the Lower Gila Basin is shown in Figure 7.4-2. Principal features of land ownership in this basin are the large areas of military and national wildlife refuge lands. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. Land ownership categories are discussed below in the order of largest to smallest percentage in the basin.

U.S. Military

- 38.8% of the land is federally owned and managed by the U.S. Military.
- U.S. Military lands in the basin include the Yuma Proving Ground and the Barry Goldwater Air Force Range.
- Primary land use is military activity.

National Wildlife Refuge

- 23.4% of the land is federally owned and managed as National Wildlife Refuges (NWR).
- Most of two National Wildlife Refuges are located in this basin, the 665,000 acre Kofa NWR and the 857,000 acre Cabeza Prieta NWR. Part of the Imperial NWR is located along the California State boundary. (See Figure 7.0-9)
- Land uses include resource conservation, wildlife protection and recreation.

U.S. Bureau of Land Management (BLM)

- 20.9% of the land is federally owned and managed by the Lower Sonoran and Yuma Field Offices of the Bureau of Land Management.
- This basin contains 138,700 acres of wilderness. Including 64,000 acres of the 100,000 acre Eagletail Mountains Wilderness, the 38,000 acre Muggins Mountains Wilderness, 15,000 acres of the 64,000 acre Woolsey Peak Wilderness and 12,000 acres of the 13,000 acre Signal Mountain Wilderness. (See Figure 7.0-9)
- Land uses include grazing, resource conservation and recreation.

Private

- 5.8% of the land is private.
- Land uses include agriculture, domestic and commercial.

State Trust Land

- 4.5% of the land is held in trust for the public schools and five other beneficiaries under the State Trust Land system.
- Land uses include agriculture and grazing.

National Park Service (NPS)

- 3.9% of the land is federally owned and managed by the National Park Service as the Organ Pipe Cactus National Monument.
- Land uses include resource conservation and recreation.

Indian Reservation

- 2.3% of the land is under tribal ownership as the Tohono O'odham Indian Reservation.
- Primary land use is grazing.

Other

- 0.4% of the land is federally owned and managed by the U.S. Bureau of Reclamation (USBOR).
- This land contains pump stations for the canals that are operated by the USBOR.

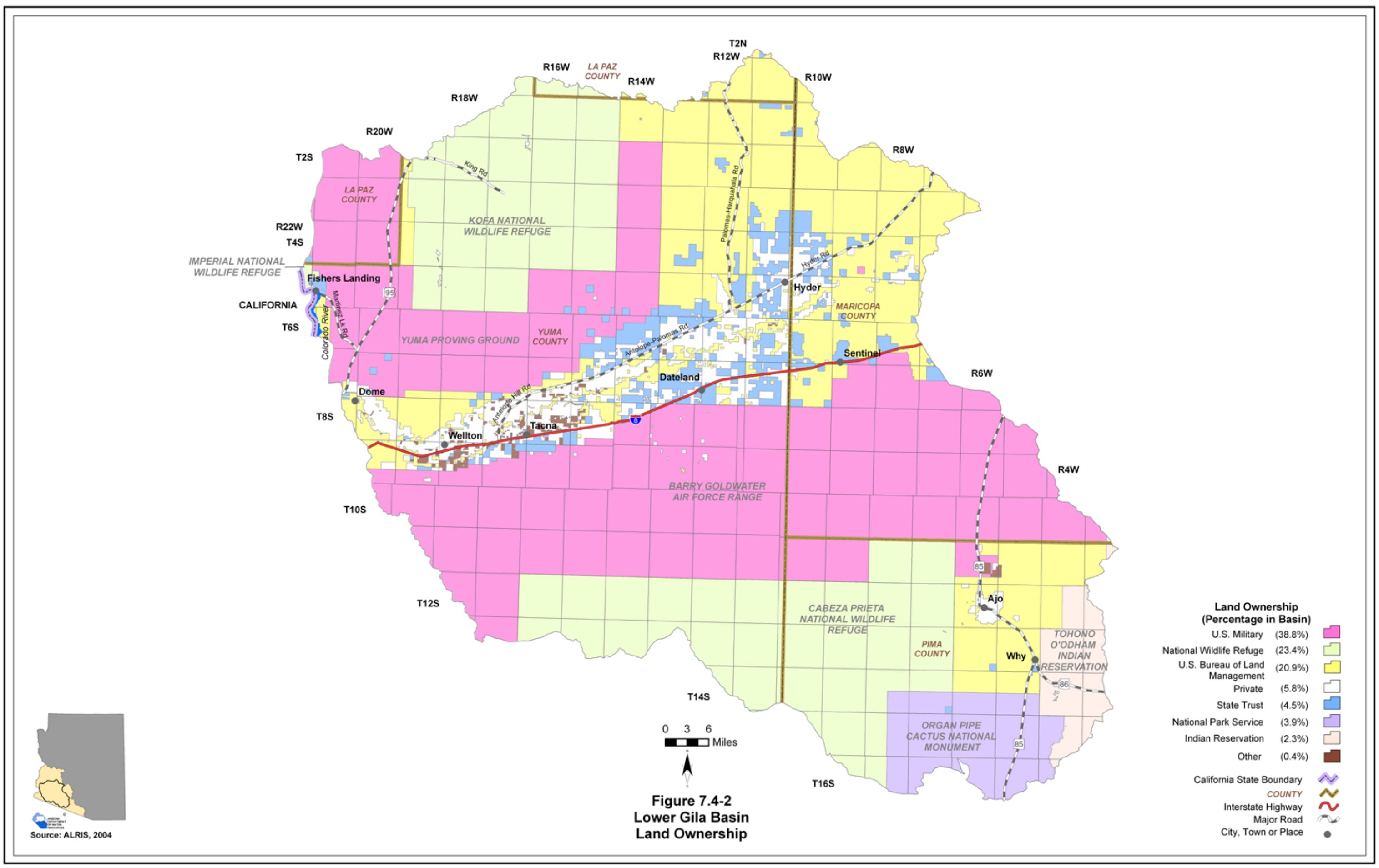


Figure 7.4-2
Lower Gila Basin
Land Ownership

7.4.3 Climate of the Lower Gila Basin

Climate data from NOAA/NWS Co-op Network and AZMET stations are complied in Table 7.4-1 and the locations are shown on Figure 7.4-3. Figure 7.4-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Lower Gila Basin does not contain Evaporation Pan or SNOTEL/ Snowcourse stations. A description of the climate data sources and methods is found in Volume 1, Section 1.3.3.

NOAA/NWS Co-op Network

- Refer to Table 7.4-1A
- Temperatures at the eight NOAA/NWS Co-op Network stations in the basin range from an average high of 94.6°F at Mohawk to an average low of 51.1°F at Wellton.
- Highest average seasonal rainfall at all stations occurs in the summer season (July-September) when approximately 37% of the annual average precipitation occurs. Many stations also receive a significant portion of precipitation in the winter (January-March) and fall (October-December) seasons. The highest average annual rainfall in the basin is 7.74 inches at the Ajo station.

AZMET

- Refer to Table 7.4-1C
- There are two AZMET stations in the basin. The stations are at 299 feet and 535 feet and have an average annual reference evapotranspiration of 78.42 inches and 88.06 inches respectively.

SCAS Precipitation Data

- See Figure 7.4-3
- Additional precipitation data show average annual rainfall as high as 16 inches in the Gunsight Hills south of Why and as low as four inches or less along the Colorado River in the western portion of the basin.

Table 7.4-1 Climate Data for the Lower Gila Basin

A. NOAA/NWS Co-op Network:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Temperature Range (in F)		Average Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
Ajo	1,800	1971 - 2000	89.9/Jul	54.5/Jan	2.10	0.43	3.20	2.01	7.74
Dateland Whitewing R	550	1971 - 2000	89.5/Jul	53.6/Dec	1.58	0.18	1.59	1.25	4.60
Kofa Mine	1,780	1971 - 2000	91.1/Jul	55.9/Dec, Jan	2.32	0.39	2.69	1.59	6.99
Mohawk	540	1900-1951	94.6/Jul	54.4/Jan	1.16	0.25	1.69	1.15	4.23
Sentinel	690	1899-1960	92.3/Jul	51.7/Dec	1.35	0.37	1.90	1.01	4.63
Tacna 3 NE	320	1971 - 2000	92.1/Jul	51.6/Dec	1.39	0.31	1.60	1.05	4.35
Wellton	260	1922-1980[1]	91.0/Jul	51.1/Jan	1.46	0.30	1.57	1.13	4.44
Yuma Proving Ground	320	1971 - 2000	93.1/Jul	55.3/Dec	1.23	0.26	1.33	0.98	3.80

Source: WRCC, 2003
Notes:
[1]Average temperature data from period of record shown; average precipitation data from 1971 - 2000

B. Evaporation Pan:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
None			

Source: WRCC, 2003.

C. AZMET:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Annual Reference Evaportranspiration, in inches *(Number of years to calculate averages)*
Dateland	535	1990 - 1996 (discontinued)	88.06 *(6)*
Roll	299	1997 - current	78.42 *(6)*

Source: Arizona Meteorological Network, 2005

D. SNOTEL/Snowcourse:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Snowpack, at Beginning of the Month, as Inches Snow Water Content *(Number of measurements to calculate average)*					
			Jan.	Feb.	March	April	May	June
None								

Source: NRCS, 2005

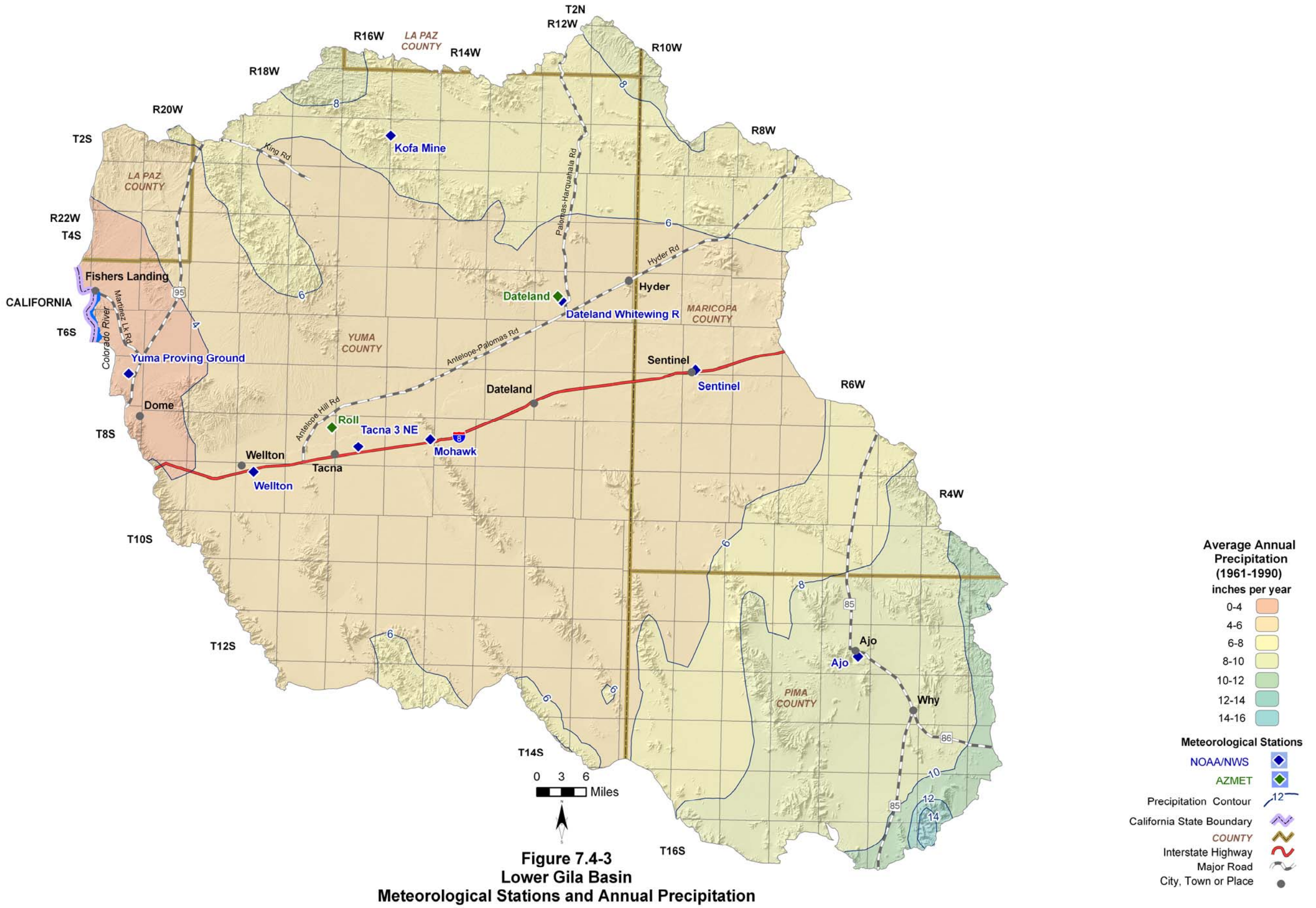


Figure 7.4-3
Lower Gila Basin
Meteorological Stations and Annual Precipitation

7.4.4 Surface Water Conditions in the Lower Gila Basin

Streamflow data, including average seasonal flow, average annual flow and other information are shown in Table 7.4-2. Flood ALERT equipment in the basin is shown in Table 7.4-3. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 7.4-4. The location of streamflow gages identified by USGS number, flood ALERT equipment, USGS runoff contours and large reservoirs are shown on Figure 7.4-4. A description of stream data sources and methods is found in Volume 1, Section 1.3.16. A description of reservoir data sources and methods is found in Volume 1, Section 1.3.11. A description of stockpond data sources and methods is found in Volume 1, Section 1.3.15.

Streamflow Data

- Refer to Table 7.4-2.
- Data from four stations located at three watercourses are shown in the table and on Figure 7.4-4.
- Average seasonal flow varies at the four stations. At one station, Colorado River below Imperial Dam, the average seasonal flow is similar in all seasons due to releases from Imperial Dam. The Rio Comez near Ajo station, with a small, local drainage area, receives 79% of its average seasonal flow in the summer season (July-September). The Gila River stations report highest average seasonal flow the spring (April-June) season.
- The largest annual flow recorded in the basin is 10 million acre-feet in 1984 at the Colorado River below Imperial Dam station with a contributing drainage area of 188,500 square miles.

Flood ALERT Equipment

- Refer to Table 7.4-3.
- Most of the nine ALERT gages in Lower Gila Basin are located along tributaries to the Gila River.

Reservoirs and Stockponds

- Refer to Table 7.4-4.
- The basin contains five large reservoirs. The largest, Imperial, has a maximum surface area of 1,402 acres.
- Three reservoirs are used for recreation and/or as fish and wildlife ponds. Two reservoirs are dry lakes.
- Surface water is stored or could be stored in six small reservoirs in the basin.
- There are 65 registered stockponds in this basin.

Runoff Contour

- Refer to Figure 7.4-4.
- Average annual runoff is highest, 0.2 inches per year or 10.66 acre-feet per square mile, in the southeastern portion of the basin and decreases to 0.1 inches, or five acre-feet per square mile, in the remainder of the basin.

Table 7.4-2 Streamflow Data for the Lower Gila Basin

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9429500	Colorado River below Imperial Dam[1]	188,500	162	1961 - current (real time)	24	21	31	24	233,128 (1971)	350,416	1,292,340	10,049,120 (1984)	31
9520170	Rio Cornez near Ajo	243	1,950	1/1967 - 9/1978 (discontinued)	8	1	79	11	615 (1969)	2,440	3,085	8,543 (1976)	11
9520280	Gila River near Dateland	55,000	NA	10/1993 - current (real time)	2	46	18	35	0 (2000, 2001, 2002)	4	69,331	610,467 (1995)	9
9520360	Gila River near Mohawk	55,430	NA	1966-/1993 (discontinued)	36	38	15	12	0 (1975-1976, 1987-1991)	413	317,233	2,029,309 (1980)	19

Sources: USGS NWIS, USGS 1998 and USGS 2003.

Notes:
NA = Not available
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Annual Flow/Year statistics were only completed for those gages that had at least 3 year of 12 month records.
Summation of Average Annual Flows may not equal 100 due to rounding.
Period of record may not equal Year of Record used for annual Flow/Year statistics due to only using years with a 12 month record

Table 7.4-3 Flood ALERT Equipment in the Lower Gila Basin

Station ID	Station Name	Station Type	Install Date	Responsibility
5000	Mt. Oatman	Repeater/Precipitation	4/1/1981	Maricopa Country FCD
5010	Columbus Wash	Precipitation/Stage	9/21/1999	Maricopa County FCD
5030	Copper Wash	Precipitation/Stage	2/20/2001	Maricopa County FCD
5040	4th of July Wash	Precipitation/Stage	3/14/2002	Maricopa County FCD
5050	Gila Bend Mountains	Weather Station	6/1/1988	Maricopa County FCD
7202	Kofa	Precipitation	12/6/2001	ADWR
7204	Dateland	Precipitation	12/5/2001	ADWR
7210	Wellton Weather Station	Weather Station	4/29/2004	ADWR
7220	Cabeza Prieta aka Ajo	Weather Station	7/31/2004	ADWR

Notes:
ADWR = Arizona Department of Water Resources
FCD = Flood Control District
NA = Information is not available at this time

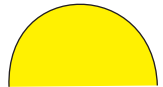


Table 7.4-4 Reservoirs and Stockponds in the Lower Gila Basin

A. Large Reservoirs (500 acre-feet capacity and greater)

MAP KEY	RESERVOIR/LAKE NAME *(Name of dam, if different)*	OWNER/OPERATOR	MAXIMUM STORAGE (AF)	USE[1]	JURISDICTION
1	Imperial	Bureau of Reclamation	160,000[2]	S,I	Federal

Source: BOR 2007

B. Other Large Reservoirs (50 acre surface area or greater)[3]

MAP KEY	RESERVOIR/LAKE NAME *(Name of dam, if different)*	OWNER/OPERATOR	MAXIMUM SURFACE AREA (acres)	USE[1]	JURISDICTION
2	Martinez	Bureau of Reclamation	640	R,F	Federal
3	Painted Rock Borrow Pit	Bureau of Reclamation	350	F	Federal
4	Unnamed[4]	USAF	100	NA	Federal
5	Unnamed[4]	USAF	69	NA	Federal

C. Small Reservoirs (greater than 15 acre-feet and less than 500 acre-feet capacity)

Total number: 0
Total maximum storage: 0 acre-feet

D. Other Small Reservoirs (between 5 and 50 acres surface area)[3]

Total number: 6
Total surface area: 70 acres

E. Stockponds (up to 15 acre-feet capacity)

Total number: 65

Notes:
[1] I = Irrigation, S = Water Supply, R = Recreation, F = fish & wildlife pond
[2]Much of the storage is in CA.
[3]Capacity data is not available to ADWR
[4] Dry lake
USAF = United States Air Force

Stream Data Source: ALRIS, 2005

Figure 7.4-4
Lower Gila Basin
Surface Water Conditions

- USGS Annual Runoff Contour for 1951-1980 (in inches)
- Stream Channel (width of line reflects stream order)
- Large Reservoir
- USGS Gage and Station ID
- Flood ALERT Equip. & Station ID
- California State Boundary
- COUNTY
- Interstate Highway
- Major Road
- City, Town or Place

7.4.5 Perennial/Intermittent Streams and Major Springs in the Lower Gila Basin

The total number of springs in the basin are shown in Table 7.4-5. The locations of perennial streams are shown on Figure 7.4-5. A description of data sources and methods for intermittent and perennial reaches is found in Volume 1, Section 1.3.16. A description of spring data sources and methods is found in Volume 1, Section 1.3.14.

- There is one intermittent stream, the Gila River and one perennial stream, Colorado River.
- There are no major or minor springs in the basin.
- The total number of springs, regardless of discharge, identified by the USGS varies from six to eight, depending on the database reference.

Table 7.4-5 Springs in the Lower Gila Basin

A. Major Springs (10 gpm or greater):

Map Key	Name	Location		Discharge (in gpm)	Date Discharge Measured
		Latitude	Longitude		
None identified by ADWR at this time					

B. Minor Springs (1 to 10 gpm):

Name	Location		Discharge (in gpm)	Date Discharge Measured
	Latitude	Longitude		
None identified by ADWR at this time				

C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005 and USGS, 2006): 6 - 8

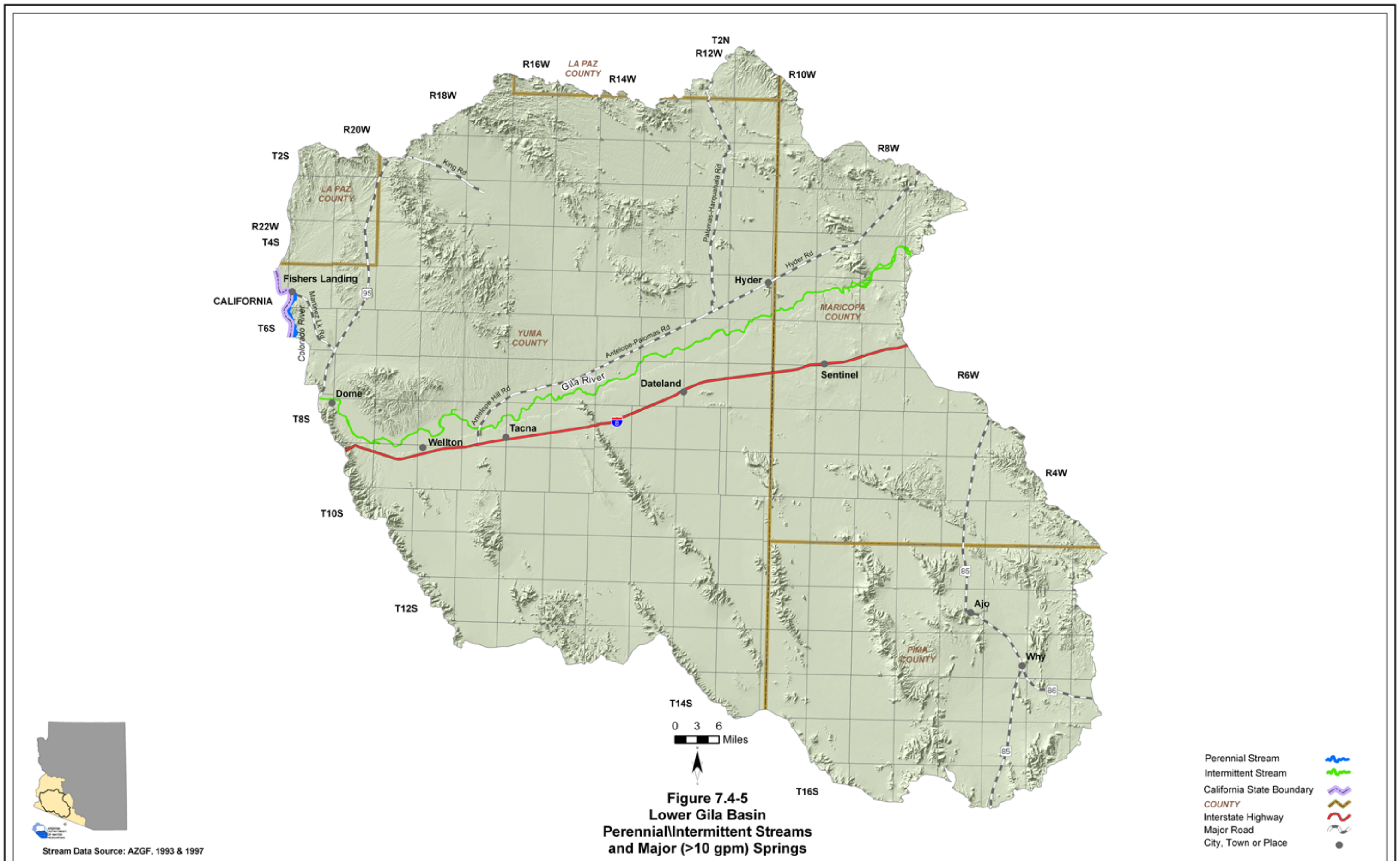


Figure 7.4-5
Lower Gila Basin
Perennial\Intermittent Streams
and Major (>10 gpm) Springs

7.4.6 Groundwater Conditions of the Lower Gila Basin

Major aquifers, well yields, estimated water in storage, number of index wells and date of last water-level sweep are shown in Table 7.4-6. Figure 7.4-6 shows aquifer flow direction and water-level change between 1990-1991 and 2003-2004. Figure 7.4-7 contains hydrographs for selected wells shown on Figure 7.4-6. Figure 7.4-8 shows well yields in five yield categories. A description of aquifer data sources and methods is found in Volume 1, Section 1.3.2. A description of well data sources and methods, including water-level changes and well yields, is found in Volume 1, Section 1.3.19.

Major Aquifers

- Refer to Table 7.4-6 and Figure 7.4-6
- The major aquifers are recent stream alluvium and basin fill.
- Predevelopment flow direction was from the north and southeast edges of the basin to the Gila River and downstream to the southwest. Extensive agricultural development has created a series of cones of depression including the Hyder Valley cone that pulls water from the Hyder area to the north and a cone east of Dateland.

Well Yields

- Refer to Table 7.4-6 and Figure 7.4-8
- As shown on Figure 7.4-8, well yields are generally greater than 1,000 gallons per minute (gpm).
- One source of well yield information, based on 597 reported wells, indicates that the median well yield is 1,600 gpm.

Natural Recharge

- Refer to Table 7.4-6
- There are two estimates of natural recharge ranging from greater than 9,000 acre-feet per year to 88,000 acre-feet per year.
- The largest source of natural recharge is runoff in washes and the Gila River floodplain. (ADWR 1994)
- In the western portion of the basin, “artificial” recharge from infiltration of irrigation water requires pumping of excess groundwater into drainage canals for removal from the basin. (ADWR 1994)

Water in Storage

- Refer to Table 7.4-6
- There are three estimates of water in storage ranging from 100 million acre-feet to a depth of 1,200 feet to 246 million acre-feet to an unknown depth.

Water Level

- Refer to Figure 7.4-6. Water levels are shown for wells measured in 2003-2004.
- The Department annually measures 33 index wells in this basin; hydrographs for 10 index wells and one other well are shown on Figure 7.4-7.
- The deepest water level shown on the map is 809 feet in the vicinity of Why and the shallowest is five feet northeast of Wellton.

Table 7.4-6 Groundwater Data for the Lower Gila Basin

Basin Area, in square miles:	7,309	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Recent Stream Alluvium	
	Basin Fill	
Well Yields, in gal/min:	Range 184-5,095 Median 1,823.5 (56 wells measured)	Measured by ADWR and/or USGS
	Range 10-6,000 Median 1,600 (597 wells reported)	Reported on registration forms for large (> 10-inch) diameter wells
	Range 100-2,500	ADWR (1990 and 1994)
	Range 0-2,500	USGS (1994)
Estimated Natural Recharge, in acre-feet/year:	88,000	Freethey and Anderson (1986)
	>9,000	Arizona Water Commission (1975)
Estimated Water Currently in Storage, in acre-feet:	143,900,000 (to 1,200 ft)	ADWR (1990)
	100,000,000[1] (to 1,200 ft)	Freethey and Anderson (1986)
	246,000,000	Arizona Water Commission (1975)
Current Number of Index Wells:	33	
Date of Last Water-level Sweep:	1992 (589 wells measured)	

[1]Predevelopment Estimate

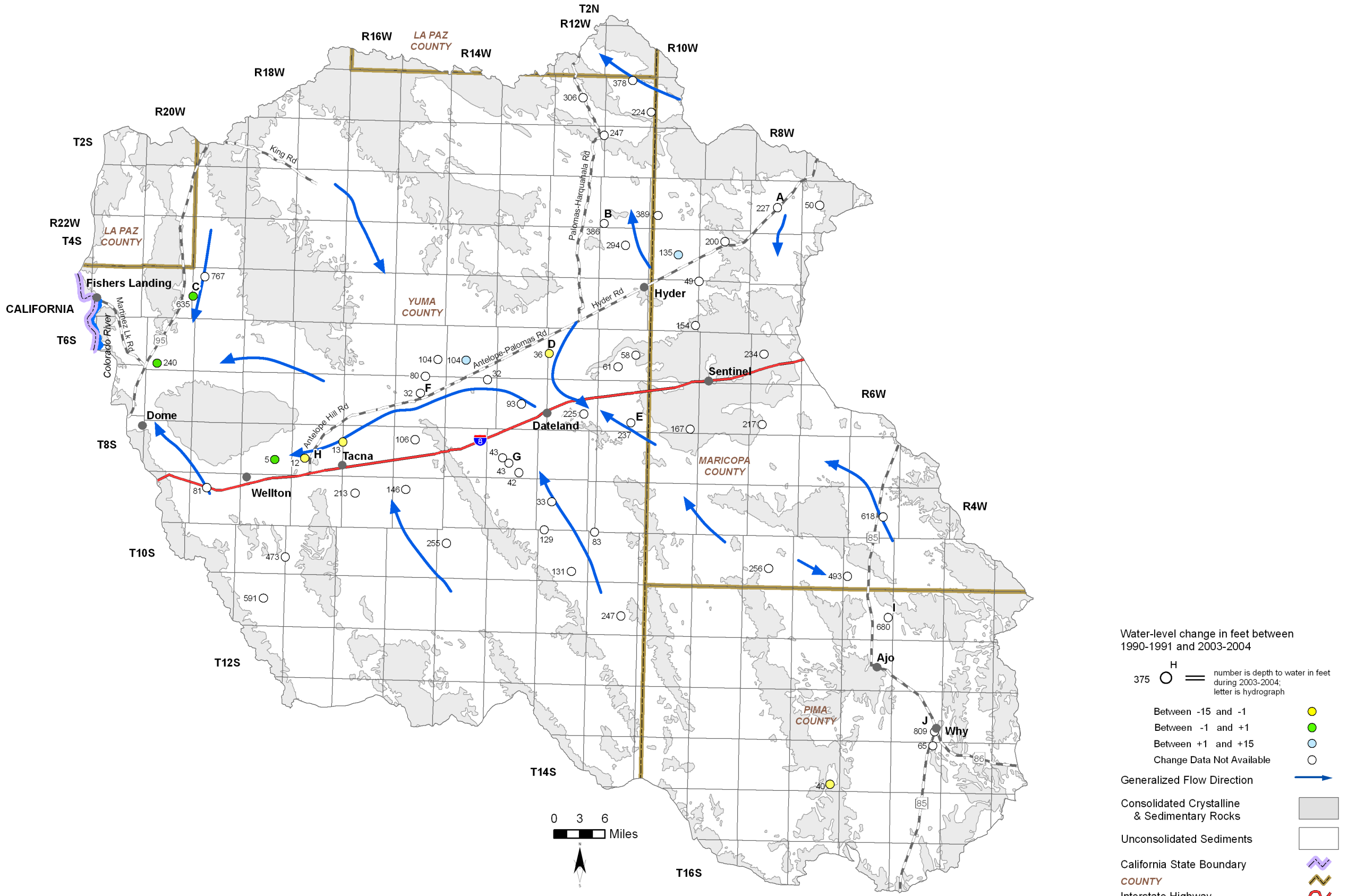


Figure 7.4-6
Lower Gila Basin
Groundwater Conditions

Figure 7.4-7
Lower Gila Basin
Hydrographs Showing Depth to Water in Selected Wells

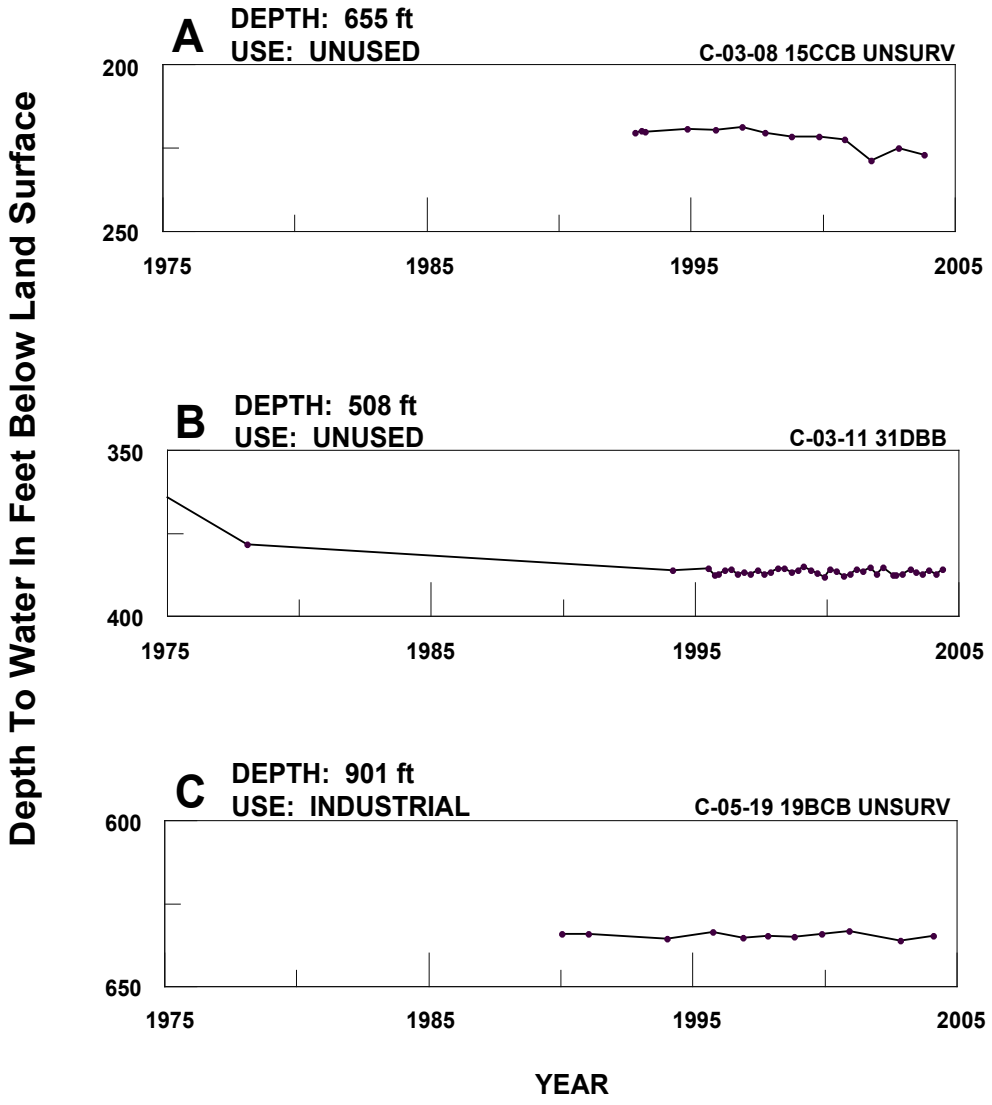


Figure 7.4-7 (cont'd)
Lower Gila Basin
Hydrographs Showing Depth to Water in Selected Wells

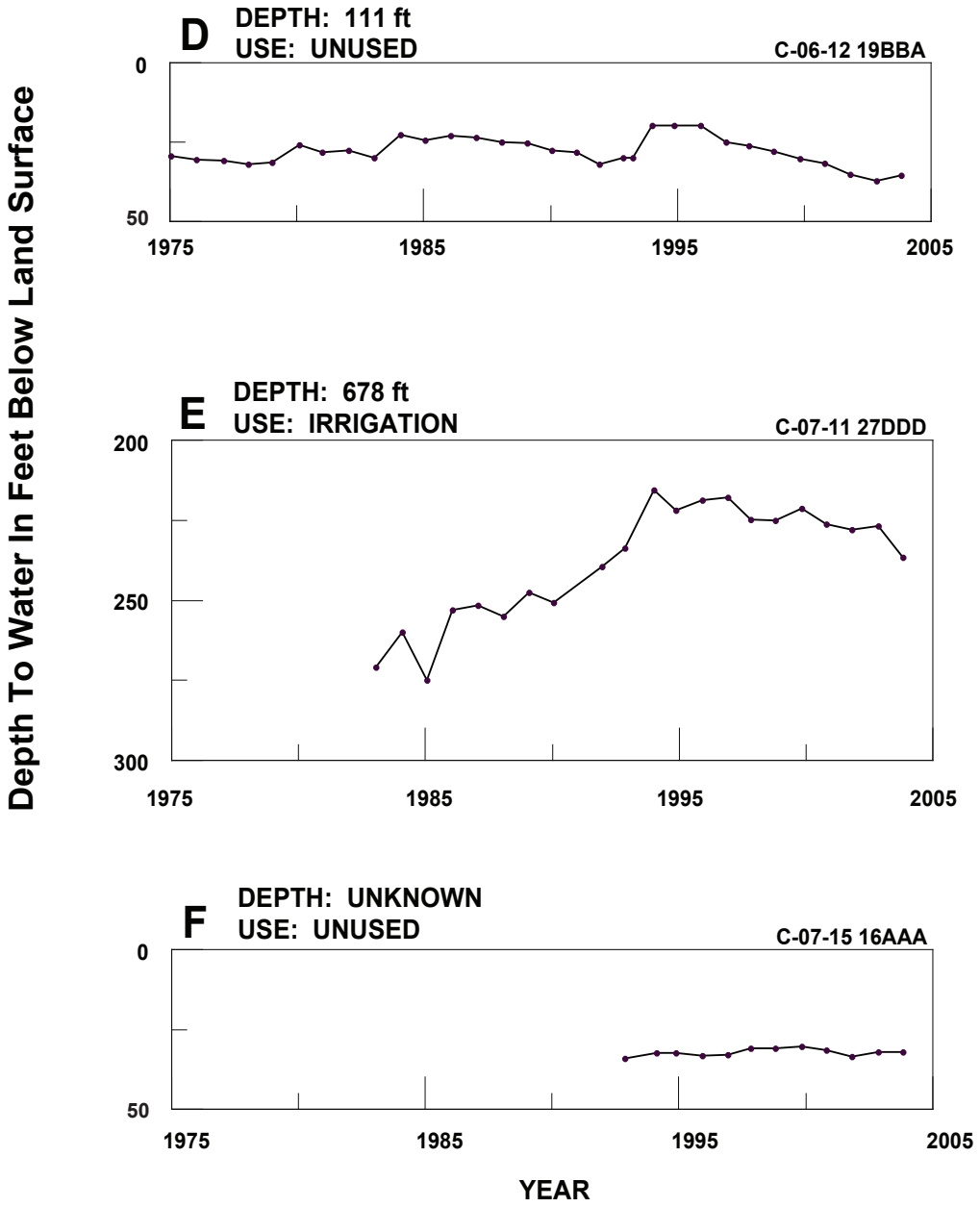
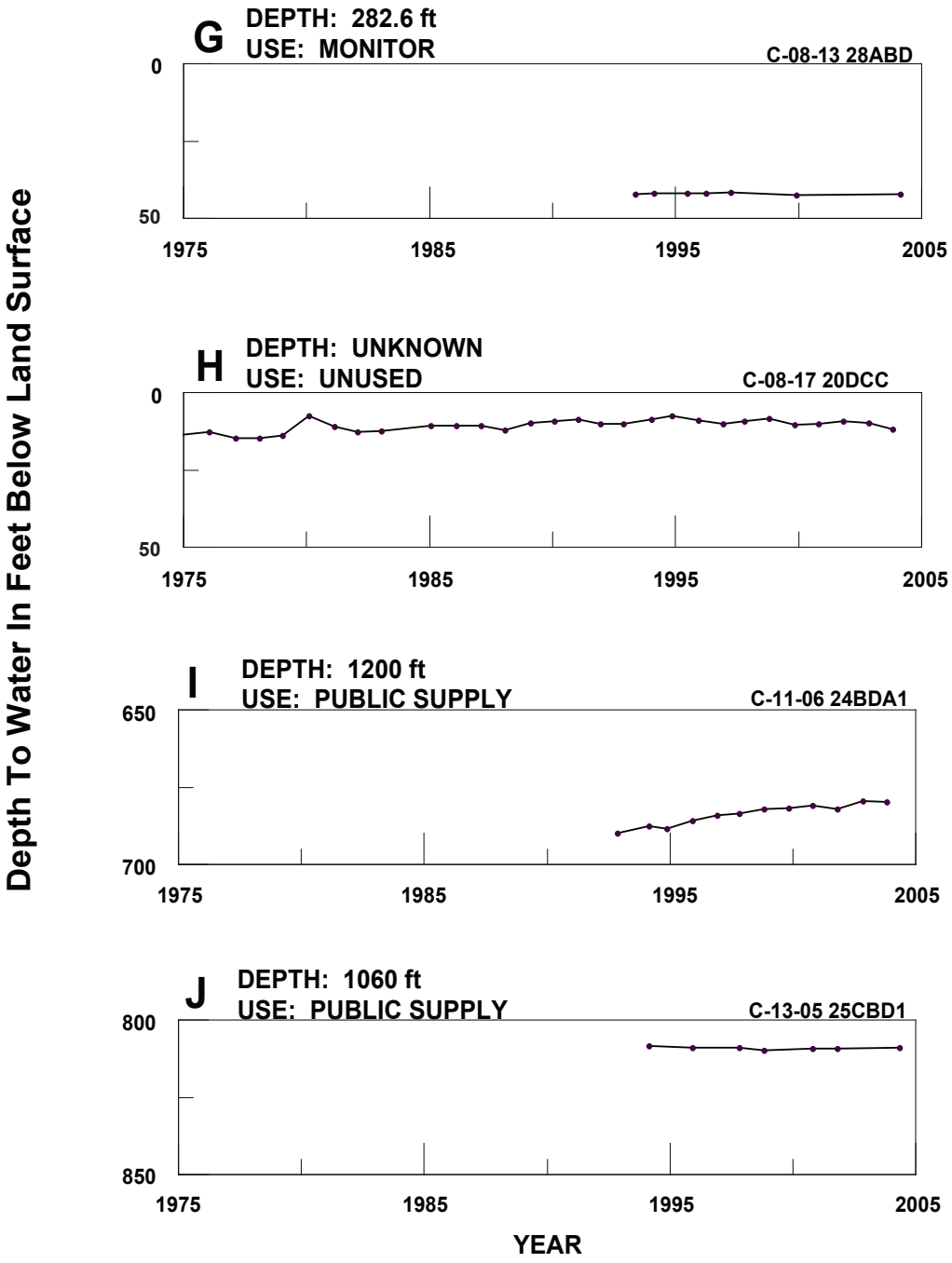


Figure 7.4-7 (cont'd)
Lower Gila Basin
Hydrographs Showing Depth to Water in Selected Wells



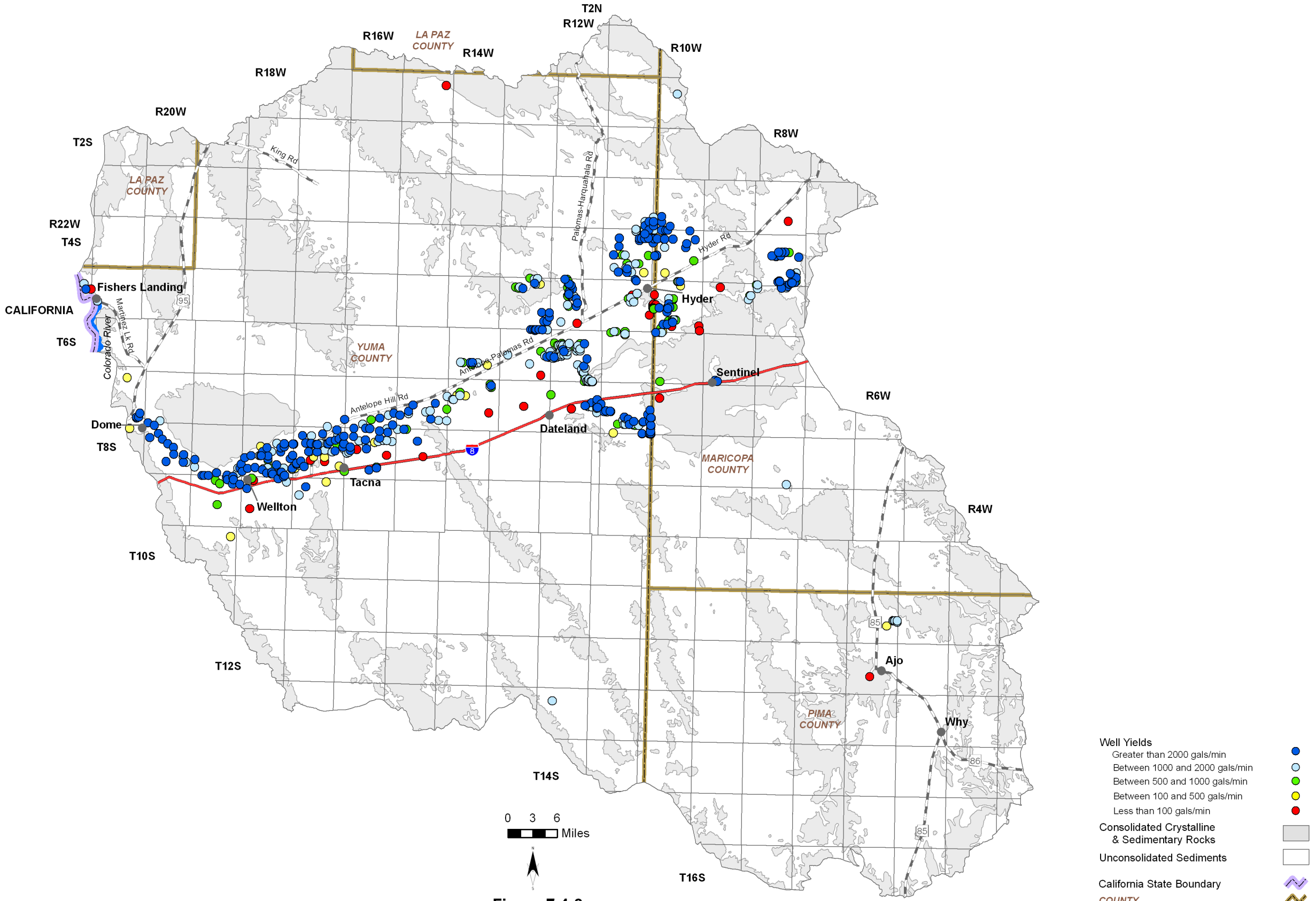


Figure 7.4-8
Lower Gila Basin
Well Yields

7.4.7 Water Quality of the Lower Gila Basin

Wells, springs and mine sites with parameter concentrations that have equaled or exceeded drinking water standard(s), including location and parameter(s) are shown in Table 7.4-7A. Impaired lakes and streams with site type, name, length of impaired reach, area of impaired lake, designated use standard and parameter(s) exceeded is shown in Table 7.4-7B. Figure 7.4-9 shows the location of water quality occurrences keyed to Table 7.4-7. A description of water quality data sources and methods is found in Volume 1, Section 1.3.18. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

Wells, Springs and Mine Sites

- Refer to Table 7.4-7A.
- Two hundred and forty-six wells have parameter concentrations that have equaled or exceeded drinking water standards.
- Sixty-four percent of the wells equaled or exceeded the parameter for fluoride.
- Other parameters equaled or exceeded include arsenic, cadmium, lead, nitrate, selenium and total dissolved solids.

Lakes and Streams

- Refer to Table 7.4-7B.
- The water quality standard for boron and selenium was equaled or exceeded in one 28 mile reach of the Gila River, a portion of this reach is also in the Yuma Basin. The standard for organics and dissolved oxygen was equaled or exceeded at Painted Rock Borrow Pit Lake.
- Neither the reach of the Gila River nor the lake are part of the ADEQ water quality improvement effort, the Total Maximum Daily Load (TMDL) Program, at this time.

Table 7.4-7 Water Quality Exceedences in the Lower Gila Basin[1]

A. Wells, Springs and Mines

Map Key	Map Location[2]	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[3]
			Township	Range	Section	
1	M	Well	1 South	15 West	18	F
2	M	Well	2 South	17 West	1	NO3
3	A	Well	4 South	8 West	16	NO3
4	A	Well	4 South	8 West	33	As, F
5	A	Well	4 South	8 West	33	F
6	A	Well	4 South	8 West	34	F
7	A	Well	4 South	8 West	34	F
8	A	Well	4 South	8 West	35	F
9	A	Well	4 South	8 West	35	F
10	A	Well	4 South	8 West	35	F
11	A	Well	4 South	8 West	35	F
12	A	Well	4 South	8 West	35	F
13	A	Well	4 South	9 West	9	As, F
14	A	Well	4 South	10 West	2	As, F
15	A	Well	4 South	10 West	5	F
16	A	Well	4 South	10 West	5	F
17	A	Well	4 South	10 West	6	F
18	A	Well	4 South	10 West	7	F
19	A	Well	4 South	10 West	8	F
20	A	Well	4 South	10 West	17	F
21	A	Well	4 South	10 West	18	F
22	A	Well	4 South	10 West	19	F
23	A	Well	4 South	10 West	21	As, F
24	A	Well	4 South	11 West	1	F
25	A	Well	4 South	11 West	1	F
26	A	Well	4 South	11 West	1	F
27	A	Well	4 South	11 West	2	F
28	A	Well	4 South	11 West	2	As, F
29	A	Well	4 South	11 West	8	As
30	A	Well	4 South	11 West	12	F
31	A	Well	4 South	11 West	21	NO3
32	A	Well	4 South	11 West	21	As, F, NO3
33	A	Well	4 South	11 West	21	F
34	A	Well	4 South	11 West	29	As, F
35	A	Well	4 South	11 West	33	F
36	A	Well	4 South	11 West	35	F
37	M	Well	4 South	19 West	21	NO3
38	A	Well	5 South	8 West	3	As
39	A	Well	5 South	8 West	3	F
40	A	Well	5 South	8 West	6	F
41	A	Well	5 South	9 West	6	F
42	A	Well	5 South	9 West	12	F
43	A	Well	5 South	9 West	12	As, F
44	A	Well	5 South	9 West	12	F
45	A	Well	5 South	9 West	13	F
46	A	Well	5 South	10 West	3	F
47	A	Well	5 South	10 West	3	F
48	A	Well	5 South	10 West	16	F
49	A	Well	5 South	10 West	16	As, NO3, TDS
50	A	Well	5 South	10 West	20	F
51	A	Well	5 South	10 West	28	As, F
52	A	Well	5 South	10 West	32	F

Table 7.4-7 Water Quality Exceedences in the Lower Gila Basin (cont'd.)[1]

A. Wells, Springs and Mines

Map Key	Map Location[2]	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[3]
			Township	Range	Section	
53	A	Well	5 South	10 West	36	F
54	A	Well	5 South	11 West	2	F
55	A	Well	5 South	11 West	15	F
56	A	Well	5 South	11 West	15	As, NO3
57	A	Well	5 South	12 West	4	F
58	A	Well	5 South	12 West	4	F
59	A	Well	5 South	12 West	4	F
60	A	Well	5 South	12 West	4	F
61	A	Well	5 South	12 West	5	F
62	A	Well	5 South	12 West	9	F
63	A	Well	5 South	12 West	9	F
64	A	Well	5 South	12 West	16	F
65	A	Well	5 South	12 West	16	As, NO3
66	A	Well	5 South	12 West	22	As
67	A	Well	5 South	13 West	36	F
68	A	Well	5 South	13 West	36	F
69	A	Well	5 South	13 West	36	F
70	M	Well	5 South	19 West	5	F
71	M	Well	5 South	19 West	19	F
72	M	Well	5 South	21 West	19	As, F
73	A	Well	6 South	8 West	17	F
74	A	Well	6 South	9 West	5	F
75	A	Well	6 South	9 West	32	As, F
76	A	Well	6 South	10 West	35	Pb
77	A	Well	6 South	10 West	35	F
78	A	Well	6 South	12 West	8	F
79	A	Well	6 South	12 West	10	F, TDS
80	A	Well	6 South	12 West	17	F
81	A	Well	6 South	12 West	18	F
82	A	Well	6 South	12 West	18	F
83	A	Well	6 South	12 West	19	NO3, TDS
84	A	Well	6 South	12 West	27	F
85	A	Well	6 South	12 West	30	F
86	A	Well	6 South	12 West	35	F
87	A	Well	6 South	12 West	35	F
88	A	Well	6 South	12 West	35	F
89	A	Well	6 South	12 West	35	F
90	A	Well	6 South	12 West	35	F
91	A	Well	6 South	13 West	3	As
92	A	Well	6 South	14 West	22	As
93	M	Well	6 South	15 West	15	F
94	M	Well	6 South	18 West	32	F
95	M	Well	6 South	20 West	21	F
96	M	Well	6 South	20 West	21	F
97	M	Well	6 South	20 West	32	F
98	M	Well	6 South	21 West	10	F
99	M	Well	6 South	21 West	23	F
100	M	Well	6 South	21 West	34	F
101	A	Well	7 South	10 West	7	F
102	M	Well	7 South	10 West	22	F
103	M	Well	7 South	10 West	22	F
104	M	Well	7 South	10 West	36	F

Table 7.4-7 Water Quality Exceedences in the Lower Gila Basin (cont'd.)[1]

A. Wells, Springs and Mines

Map Key	Map Location[2]	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[3]
			Township	Range	Section	
105	M	Well	7 South	11 West	19	F
106	M	Well	7 South	11 West	24	F
107	M	Well	7 South	11 West	25	F
108	M	Well	7 South	11 West	25	F
109	M	Well	7 South	11 West	25	F
110	M	Well	7 South	11 West	25	F
111	M	Well	7 South	11 West	26	F
112	M	Well	7 South	11 West	26	F
113	M	Well	7 South	11 West	28	F
114	M	Well	7 South	11 West	28	F
115	M	Well	7 South	11 West	32	F
116	M	Well	7 South	11 West	36	F
117	M	Well	7 South	11 West	36	F
118	M	Well	7 South	11 West	36	F
119	M	Well	7 South	11 West	36	F
120	M	Well	7 South	11 West	36	As, F
121	A	Well	7 South	12 West	7	As, F
122	A	Well	7 South	12 West	8	As, F
123	A	Well	7 South	12 West	13	F
124	A	Well	7 South	12 West	13	As, F
125	A	Well	7 South	12 West	13	F
126	M	Well	7 South	12 West	14	F
127	M	Well	7 South	12 West	17	F
128	M	Well	7 South	12 West	21	F
129	M	Well	7 South	12 West	23	F
130	M	Well	7 South	12 West	25	F
131	A	Well	7 South	13 West	13	F
132	M	Well	7 South	13 West	21	F
133	M	Well	7 South	13 West	24	TDS
134	M	Well	7 South	13 West	24	As, F
135	M	Well	7 South	13 West	24	As, F
136	M	Well	7 South	13 West	24	F
137	M	Well	7 South	14 West	24	F
138	M	Well	7 South	14 West	24	F
139	B	Well	7 South	15 West	13	TDS
140	B	Well	7 South	15 West	14	TDS
141	B	Well	7 South	15 West	20	TDS
142	B	Well	7 South	15 West	20	TDS
143	B	Well	7 South	15 West	22	TDS
144	B	Well	7 South	15 West	22	TDS
145	B	Well	7 South	15 West	25	TDS
146	B	Well	7 South	15 West	26	As, F, TDS
147	B	Well	7 South	15 West	29	TDS
148	B	Well	7 South	15 West	30	TDS
149	B	Well	7 South	16 West	25	F, TDS
150	B	Well	7 South	16 West	26	TDS
151	B	Well	7 South	16 West	31	F
152	B	Well	7 South	16 West	33	TDS
153	B	Well	7 South	16 West	34	TDS
154	B	Well	7 South	17 West	34	F, NO3, TDS
155	B	Well	7 South	17 West	35	As, NO3, TDS
156	B	Well	7 South	19 West	14	Pb

Table 7.4-7 Water Quality Exceedences in the Lower Gila Basin (cont'd.)[1]

A. Wells, Springs and Mines

Map Key	Map Location[2]	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[3]
			Township	Range	Section	
157	M	Well	7 South	21 West	10	F
158	M	Well	7 South	21 West	10	As
159	M	Well	7 South	21 West	11	F
160	M	Well	8 South	13 West	6	Pb, TDS
161	M	Well	8 South	13 West	20	NO3, TDS
162	M	Well	8 South	13 West	28	NO3, TDS
163	M	Well	8 South	13 West	34	TDS
164	B	Well	8 South	14 West	16	F
165	B	Well	8 South	14 West	16	F
166	B	Well	8 South	16 West	2	As
167	B	Well	8 South	16 West	4	TDS
168	B	Well	8 South	16 West	5	As, TDS
169	B	Well	8 South	16 West	7	NO3
170	B	Well	8 South	16 West	9	TDS
171	B	Well	8 South	16 West	9	TDS
172	B	Well	8 South	16 West	11	F, NO3
173	B	Well	8 South	16 West	11	TDS
174	B	Well	8 South	17 West	1	TDS
175	B	Well	8 South	17 West	3	TDS
176	B	Well	8 South	17 West	3	As, NO3
177	B	Well	8 South	17 West	3	As, F
178	B	Well	8 South	17 West	9	NO3, TDS
179	B	Well	8 South	17 West	9	As, TDS
180	B	Well	8 South	17 West	10	TDS
181	B	Well	8 South	17 West	10	TDS
182	B	Well	8 South	17 West	13	TDS
183	B	Well	8 South	17 West	14	As, F
184	B	Well	8 South	17 West	17	TDS
185	B	Well	8 South	17 West	18	TDS
186	B	Well	8 South	17 West	18	TDS
187	B	Well	8 South	17 West	18	TDS
188	B	Well	8 South	17 West	25	As
189	B	Well	8 South	17 West	25	As
190	B	Well	8 South	18 West	14	F, TDS
191	B	Well	8 South	18 West	14	F, TDS
192	B	Well	8 South	18 West	20	As, TDS
193	B	Well	8 South	18 West	21	F, TDS
194	B	Well	8 South	18 West	21	TDS
195	B	Well	8 South	18 West	22	TDS
196	B	Well	8 South	18 West	25	As
197	B	Well	8 South	18 West	26	TDS
198	B	Well	8 South	18 West	27	TDS
199	B	Well	8 South	18 West	29	F
200	B	Well	8 South	18 West	29	As, TDS
201	B	Well	8 South	18 West	31	TDS
202	B	Well	8 South	18 West	34	As
203	B	Well	8 South	18 West	36	NO3
204	B	Well	8 South	19 West	25	TDS
205	B	Well	8 South	19 West	31	TDS
206	B	Well	8 South	19 West	36	TDS
207	B	Well	8 South	19 West	36	TDS
208	M	Well	8 South	20 West	9	As, TDS

Table 7.4-7 Water Quality Exceedences in the Lower Gila Basin (cont'd.)[1]

A. Wells, Springs and Mines

Map Key	Map Location[2]	Site Type	Site Location			Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[3]
			Township	Range	Section	
209	M	Well	8 South	20 West	9	NO3, TDS
210	M	Well	8 South	20 West	9	TDS
211	M	Well	8 South	20 West	15	As, TDS
212	M	Well	8 South	20 West	25	As, TDS
213	M	Well	8 South	20.5 West	6	TDS
214	M	Well	8 South	21 West	1	TDS
215	M	Well	8 South	21 West	1	As
216	M	Well	9 South	6 West	23	F
217	M	Well	9 South	7 West	29	As
218	M	Well	9 South	11.5 West	36	F
219	M	Well	9 South	12 West	16	NO3, TDS
220	M	Well	9 South	12 West	31	As, F
221	B	Well	9 South	17 West	4	TDS
222	B	Well	9 South	17 West	9	F
223	B	Well	9 South	18 West	6	F
224	B	Well	9 South	18 West	10	F, NO3, TDS
225	B	Well	9 South	18 West	11	F
226	B	Well	9 South	18 West	19	F, TDS
227	B	Well	9 South	18 West	19	F, TDS
228	B	Well	9 South	18 West	20	F
229	B	Well	9 South	19 West	1	As, TDS
230	B	Well	9 South	19 West	1	F
231	B	Well	9 South	19 West	2	As
232	B	Well	9 South	19 West	3	TDS
233	B	Well	9 South	19 West	3	As, F
234	B	Well	9 South	19 West	4	As, TDS
235	B	Well	9 South	19 West	4	TDS
236	B	Well	9 South	19 West	6	F, TDS
237	B	Well	9 South	19 West	13	As, F
238	B	Well	9 South	19 West	24	TDS
239	M	Well	10 South	6 West	30	F
240	M	Well	10 South	8 West	22	F
241	M	Well	11 South	6 West	24	As, F
242	M	Well	11 South	6 West	24	As, F
243	M	Well	12 South	8 West	1	NO3
244	M	Well	12 South	8 West	17	Nos, TDS
245	M	Well	13 South	3 West	32	As
246	M	Well	13 South	5 West	25	As, Cd
247	M	Well	13 South	5 West	25	As, Cd

Table 7.4-7 Water Quality Exceedences in the Lower Gila Basin (cont'd.)[1]

B. Lakes and Streams

Map Key	Map Location[2]	Site Type	Site Name	Length of Impaired Stream Reach (in miles)	Area of Impaired Lake (in acres)	Designated Use Standard[4]	Parameter(s) Exceeding Use Standard[3]
a	M, B	Stream	Gila River (Coyote Wash to Fortuna Wash)	28	NA	A&W	B, Se
b	A	Lake	Painted Rock Borrow Pit Lake	NA	186	A&W, FC	Dissolved Oxygen, Organics

Notes:

[1] Water quality samples collected between 1975 and 2004.
[2] M = main map, A = inset A, B = inset B
[3] As = Arsenic
Bo = Boron
Cd = Cadmium
F = Fluoride
Pb = Lead
NO3 = Nitrate/ Nitrite
Organics = One or more of several volatile and semi-volatile organic compounds and pesticides
TDS = Total Dissolved Solids
Se = Selenium
[4] A&W = Aquatic and Wildlife
FC = Fish Consumption

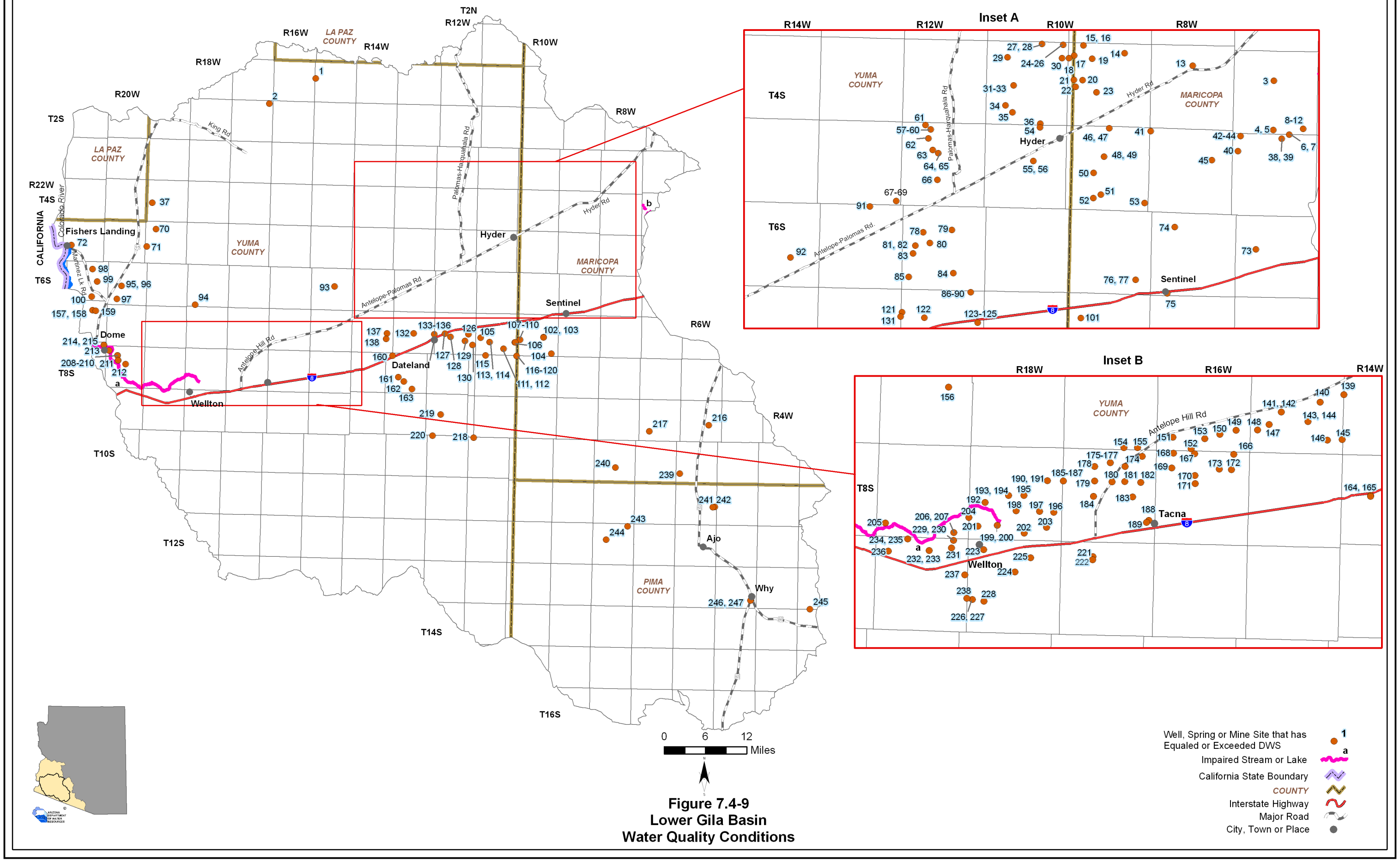


Figure 7.4-9
Lower Gila Basin
Water Quality Conditions

7.4.8 Cultural Water Demands in the Lower Gila Basin

Cultural water demand data including population, number of wells and the average well pumpage and surface water diversions by the municipal, industrial and agricultural sectors are shown in Table 7.4-8. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 7.4-9. Figure 7.4-10 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Section 1.3.5. More detailed information on cultural water demands is found in Section 7.0.7.

Cultural Water Demands

- Refer to Table 7.4-8 and Figure 7.4-10.
- Population in this basin increased from 9,873 in 1980 to 11,303 in 2000 and projections suggest an increase of over 9,000 residents by 2050.
- Most cultural water use is for irrigation primarily near the Gila River.
- Agricultural water demand for groundwater and surface water increased approximately 10% between 1991 and 2003.
- Industrial groundwater demand is relatively small but increased 5% from 1991 to 2003. Industrial uses in the basin include multiple dairies and a large feedlot.
- Municipal groundwater demand is relatively small and increased 16% from 1991 to 2003. Municipal surface water use is also minimal but increased 50% from 1991 to 2003.
- As of 2003 there were 1,674 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 593 wells with a pumping capacity of more than 35 gallons per minute.

Effluent Generation

- Refer to Table 7.4-9.
- There are seven wastewater treatment facilities in this basin.
- Information on disposal method was available for five facilities. All five facilities discharge to evaporation ponds and one facility also discharges for irrigation.

Table 7.4-8 Cultural Water Demands in the Lower Gila Basin[1]

Year	Recent (Census) and Projected (DES) Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)[3]						Data Source
				Well Pumpage[4]			Surface-Water Diversions			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Irrigation	Municipal	Industrial	Irrigation	
1971		539[2]	437[2]	360,000			1,251,000[5]			ADWR (1994)
1972										
1973										
1974										
1975										
1976				404,000			1,102,000[5]			
1977										
1978										
1979										
1980	9,873									
1981	9,813	941	74	348,000			1,130,000[5]			
1982	9,752									
1983	9,692									
1984	9,632									
1985	9,571									
1986	9,511	48	42	402,000			1,229,000[5]			
1987	9,451									
1988	9,390									
1989	9,330									
1990	9,270									
1991	9,473	40	23	1,800	3,600	254,000	400	NR	365,000	USGS (2005) ADWR (2005) ADEQ (2005)
1992	9,676									
1993	9,880									
1994	10,083									
1995	10,286									
1996	10,490	56	10	1,900	3,700	261,000	400	NR	391,000	
1997	10,693									
1998	10,896									
1999	11,100									
2000	11,303									
2001	11,407	34	3	2,100	3,800	282,000	600	NR	399,000	
2002	11,511									
2003	11,615									
2010	12,343									
2020	14,046									
2030	16,055									
2040	18,254									
2050	20,719									
ADDITIONAL WELLS: [6]		**16**	**4**							
WELL TOTALS:		**1,674**	**593**							

[1] Does not include evaporation losses from stockponds and reservoirs.
[2] Includes all wells through 1980.
[3] Includes pumpage and diversion of Colorado River Contract Water.
[4] Well pumpage for irrigation includes drainage wells.
[5] Includes surface-water diversions in Parker and Yuma basins.
[6] Other water-supply wells are listed in the ADWR Well Registry for this basin, but they do not have completion dates. These wells are summed here.
NR - Not reported

Table 7.4-9 Effluent Generation in the Lower Gila Basin

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method							Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaportion Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basins			
Ajo WWTF	Ajo ID	Ajo	1,089	50		X	X					NA		2003
Links @ Coyote Wash WWTP	NA	Wellton	NA											
Laguna Airfield	US Army	Airfield	NA	NA		X						NA		
Kofa Firing Range	US Army	Army Base		56		X						NA		
US Army Garrison- Main WWTF	US Army	Army Base	NA			X						NA		
US Army Garrison-Main Adminisitration Area WWTF	US Army	Army Base	1,000	NA		X						NA		
US Army Garrison-Material Test Area WWTP	US Army	Army Base	NA											

NA: Data not currently available to ADWR
WWTF: Waste Water Treatment Facility
WWTP: Waste Water Treatment Plant
ID: Improvement District

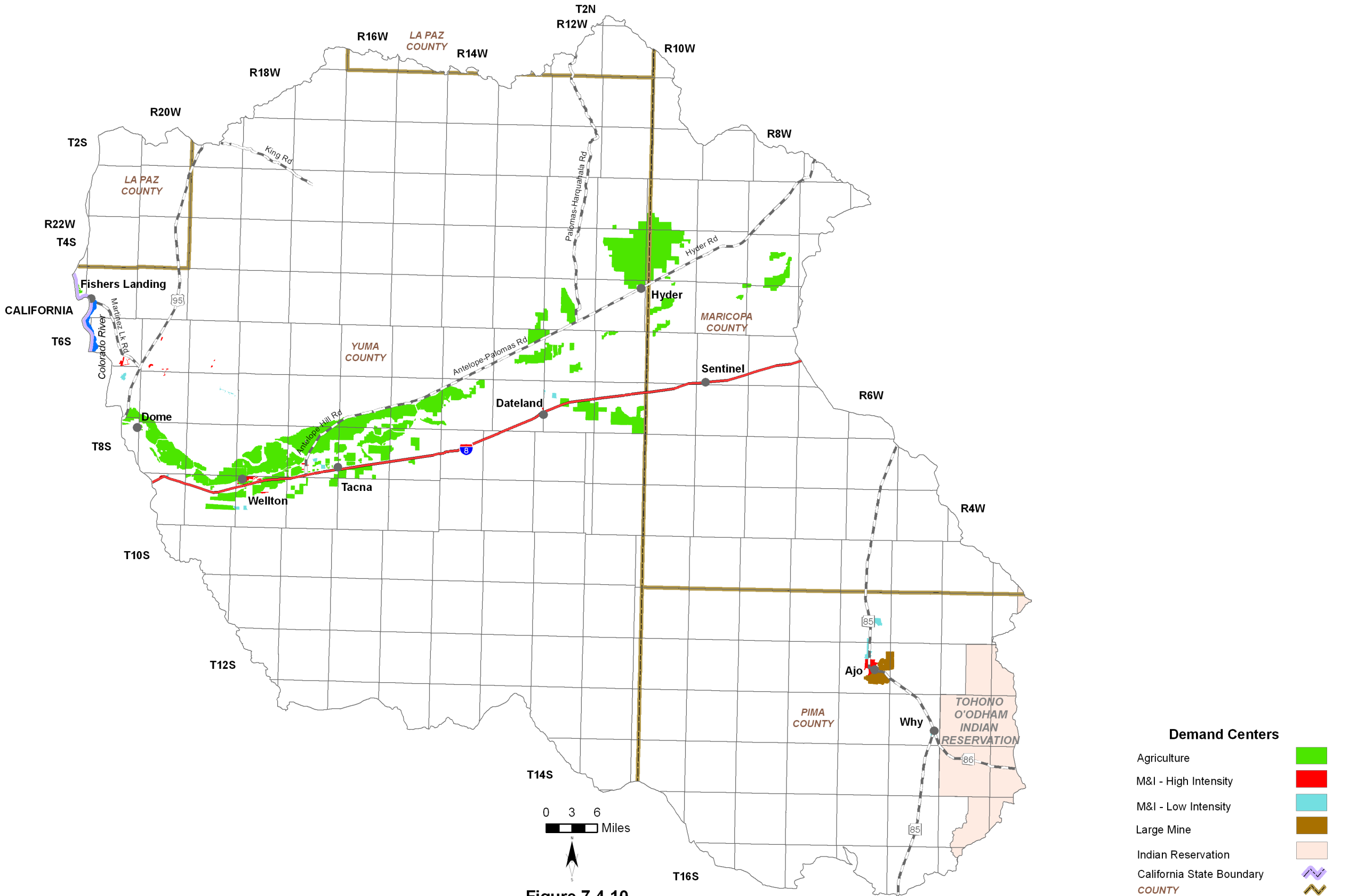


Figure 7.4-10
Lower Gila Basin
Cultural Water Demand

Primary Data Source: USGS National Gap Analysis Program, 2004

7.4.9 Water Adequacy Determinations in the Lower Gila Basin

Water adequacy determination information including the subdivision name, location, number of lots, adequacy determination, reason for an inadequacy determination, date of determination and subdivision water provider are shown in Table 7.4-10. Figure 7.4-11 shows the general locations of subdivisions (to the section level) keyed to the Table. A description of the Water Adequacy Program is found in Volume 1, Appendix A. Adequacy determination data sources and methods are found in Volume 1, Sections 1.3.1.

Water Adequacy Reports

- See Table 7.4-10
- A total of 26 water adequacy determinations have been made in this basin through May 2005.
- Six determinations of inadequacy have been made; the most common reason for an inadequacy determination was water quality.
- The number of lots receiving a water adequacy determination, by county, are:

County	Number of Subdivision Lots	Number of Lots Determined to be Adequate	Percent Adequate
Pima County	565	565	100%
Yuma County	2,079	1,748	84%

Table 7.4-10 Adequacy Determinations in the Lower Gila Basin[1]

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.[2]	ADWR Adequacy Determination	Reason(s) for Inadequacy Determination[3]	Date of Determination	Water Provider at Time of Application
			Township	Range	Section						
1	Arletta Estates	Yuma	9 South	19 West	14	8		Inadequate	C	02/05/75	Dry Lot Subdivision
2	Butterfield Bluff	Yuma	9 South	18 West	4, 5	201		Adequate		10/29/87	Town of Wellton
3	Butterfield Bluff # 4	Yuma	9 South	18 West	4	21	22-400385	Adequate		09/25/00	Town of Wellton
4	Caballo Farms	Yuma	6 South	15 West	31	60		Inadequate	C	05/19/75	Dry Lot Subdivision
5	Cameron Place Addition	Pima	12 South	6 West	15	97		Adequate		12/20/85	Ajo Improvement Company
6	Camino Viejo	Yuma	9 South	18 West	6	18	22-400480	Inadequate	C	04/25/01	Town of Wellton
7	Citrus Park	Yuma	8 South	16 West	31	656		Adequate		06/01/73	Mohawk Water Company
8	Copper Ridge Unit A	Yuma	9 South	18 West	5	8	22-400197	Adequate		12/13/99	Town of Wellton
9	Coyote Wash Condominiums	Yuma	9 South	18 West	8	80	22-401632	Adequate		03/23/05	Town of Wellton
10	Crystal Sands	Yuma	7 South	13 West	12, 13	15		Inadequate	C	07/01/74	Dry Lot Subdivision
11	Erickson	Yuma	9 South	18 West	4	8	22-400426	Adequate		12/06/00	Town of Wellton
12	Grande Vista	Yuma	8 South	17 West	27, 28, 22, 21	20	22-400243	Adequate		02/02/00	Dry Lot Subdivision
13	Hankins Subdivision	Yuma	9 South	18 West	5	17		Adequate		07/18/86	Town of Wellton
14	Jojoba Farms # 1	Yuma	7 South	12 West	16	20		Adequate		06/23/83	Dry Lot Subdivision
15	Links at Coyote Wash	Yuma	9 South	18 West	7	171	22-401007	Adequate		08/13/03	Town of Wellton
16	Links at Coyote Wash Unit 2	Yuma	10 South	19 West	7	333	22-401286	Adequate		05/18/04	Town of Wellton
17	Morisse	Yuma	3 South	19 West	29	30		Adequate		05/05/78	NA
18	New Cornelia Addition	Pima	12 South	6 West	14, 15, 22, 23	468		Adequate		02/14/86	Ajo Improvement Company
19	New Tacna Townsite	Yuma	8 South	17 West	25	10		Inadequate	C	01/15/87	Tacna Water Company
20	Orange Grove Ranch Estates	Yuma	9 South	18 West	3	122		Inadequate	C	01/15/75	Dry Lot Subdivision
21	Rio Lindo Shores	Yuma	11 South	18 West	31	36		Adequate		02/29/80	Graham Water Service
22	Rio Salado Ranches 1 & 2	Yuma	6 South	11 West	24, 25	116		Inadequate	D	03/14/74	Dry Lot Subdivision

Table 7.4-10 Adequacy Determinations in the Lower Gila Basin (cont'd)[1]

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.[2]	ADWR Adequacy Determination	Reason(s) for Inadequacy Determination[3]	Date of Determination	Water Provider at Time of Application
			Township	Range	Section						
23	Sandpiper # 1	Yuma	10 South	19 West	15	73		Adequate		01/14/82	Graham Water Service
24	Sports Valley Condominiums	Yuma	10 South	19 West	22	24		Adequate		09/01/82	Graham Water Company
25	Tacna Manor	Yuma	8 South	17 West	25	14		Adequate		08/12/81	Tacna Water Company
26	VanGelder Subdivision	Yuma	11 South	20 West	6	18		Adequate		01/24/86	Wellton, Town of

Notes:

[1]Each determination of the adequacy of water supplies available to a subdivision is based on the information available to ADWR and the standards of review and policies in effect at the time the determination was made. In some cases, ADWR might make a different determination if a similar application were submitted today, based on the hydrologic data and other information currently available, as well as current rules and policies.

[2] Prior to February 1995, ADWR did not assign file numbers to applications for adequacy determination.

[3] A. Physical/Continuous
1) Insufficient Data (applicant chose not to submit necessary information, and/or available hydrologic data insufficient to make determination)
2) Insufficient Supply (existing water supply unreliable or physically unavailable;for groundwater, depth-to-water exceeds criteria)
3) Insufficient Infrastructure (distribution system is insufficient to meet demands or applicant proposed water hauling)
B. Legal (applicant failed to demonstrate a legal right to use the water or failed to demonstrate the provider's legal authority to serve the subdivision)
C. Water Quality
D. Unable to locate records

NA = Not available to ADWR at this time

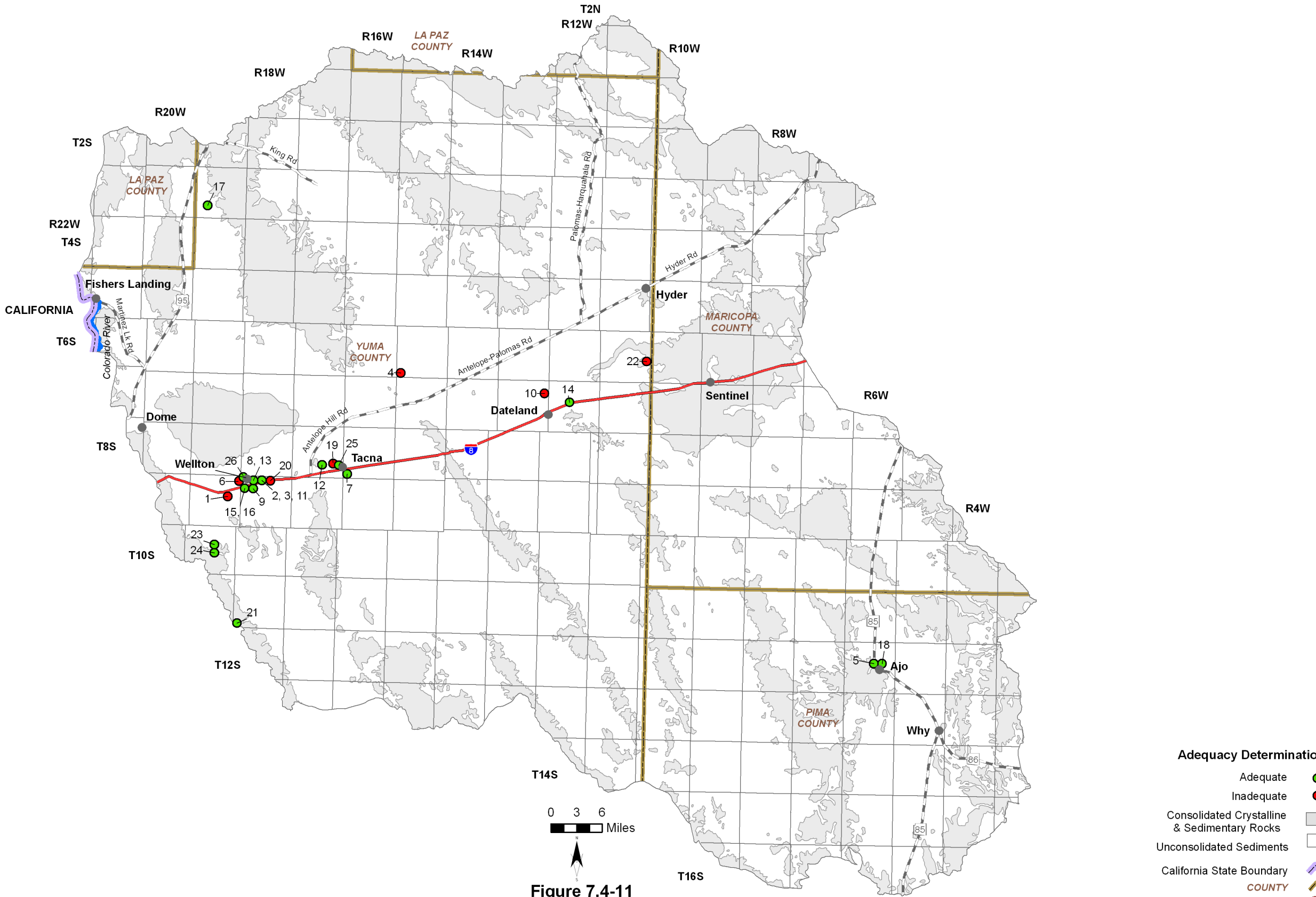


Figure 7.4-11
Lower Gila Basin
Adequacy Determinations

Adequacy Determinations

- Adequate
- Inadequate
- Consolidated Crystalline & Sedimentary Rocks
- Unconsolidated Sediments
- California State Boundary
- COUNTY
- Interstate Highway
- Major Road
- City, Town or Place

Lower Gila Basin
References and Supplemental Reading

References

A

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